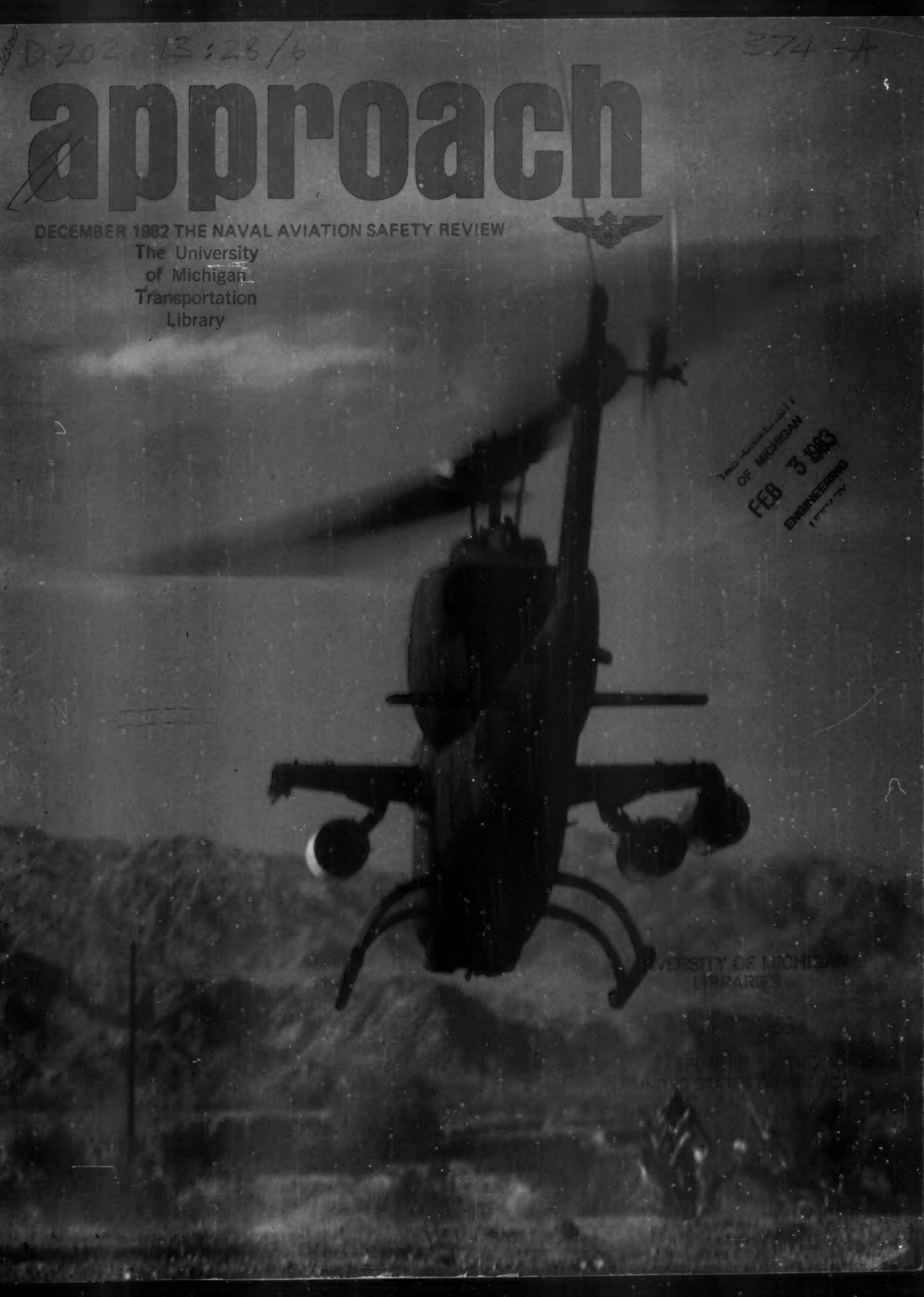
approach

DECEMBER 1982 THE NAVAL AVIATION SAFETY REVIEW



SNOW REMOVAL

IT's like flying into a Christmas card. Flurries of white snow pile up in drifts across our desks. Leave requests. Changes to the watch bill . . .

Even in airfields as warm as Yuma or 29 Palms, there's a snow of inattentiveness that builds as the holiday season grows near, a sort of white distraction that has to be cleared away before we can start to fly safely again.

That's why there are so many standdowns in January, to clear away the champagne and wrinkled hugs and X-mas cards from our friendly oil companies. To bring us back from those long drives on icy interstates.

Perhaps this invisible snow is even more dangerous than the real powder that whooshes across NAS Brunswick's 8,000-foot runways!

Snow in Yuma? Yes, I think so. And in Diego Garcia, as well. It's not the beautiful snow that we see in the Currier and Ives dreamworld, either. It's the kind of snow that can make us forget minimum descent altitudes, overrun slippery runways, and disregard exacting emergency procedures.

It's the kind that can bury us.

LT Colin Sargent

approach

Vol. 28 No. 6
NAVAIR 00-75-510

An AH-1 Huey Cobra heads north after take-off from MCAS Yuma. Photo by 1/Lt Joe Doyle, HML 367.

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COUNTDOWN to

water impact

By CDR David S. Carlson, USN
Commanding Officer, HC-11

STATISTICS indicate at least one Navy H-46 helicopter will impact the water during night operations this year, perhaps even two.

For the past 13 years, H-46 pilots from the Navy H-46 vertical replenishment community have unintentionally hit the water while night flying without a visible horizon with alarming frequency — once every 2,509 hours, to be exact. The toll in lost and damaged aircraft, aircrews, and passengers adds up to what I consider the most serious safety problem in the VERTREP community today. Since the late 1960s, I know of eight mishaps that have resulted in the total loss of four aircraft and major damage to four others. Ten crewmembers have perished following water impact. These eight mishaps are virtually identical in the following respects.:

- All occurred at night.
- All were low-level, overwater flights.
- All occurred in a no-horizon environment.
- All resulted in water impact.
- The primary cause factors were pilot errors, not mechanical failures.

Since the first mishap of this type, various corrective actions have been implemented. These actions have primarily taken the form of stringent night training requirements. Detailed crew coordination procedures were incorporated in the H-46 NATOPS Manual, and exacting night shipboard qualification criteria were established. Pilots were stationed in the ship's control tower to provide advice and to function as safety observers. Elaborate procedures were developed, and drills were conducted to recover damaged H-46s aboard service-force ships. Unfortunately, these actions have not been totally successful, for water impact mishaps have continued on a regular basis.

The following information is presented for the purpose of drawing a comparison between the H-46 and the other two Navy helicopters that operate in the embarked night low-level overwater environment: the H-2 *Seasprite* and the H-3 *Sea King*. Operating environment, equipment, and mishap statistics will be considered.

H-3 Environment and Equipment. The night embarked environment is centered about the aircraft carrier for ASW and plane guard duties. Takeoffs and landings are flown from at least a 65-foot flight deck. The plane guard pattern is 300 feet. Approaches are flown to a 40-foot hover for dipping or rescue. It is generally estimated that 40 percent of H-3 night time is flown below 200 feet. Equipment installed: Radar Altimeter Aural Warning System and coupled doppler. The H-3 NATOPS *prohibits* night and instrument flying without an operative RAAWS.

H-2-Environment and Equipment. The night embarked environment centers about small combatants with an ASW mission. Operations below 200 feet include landings, takeoffs, and doppler approaches to low hovers. It is generally estimated that less than 10 percent of H-2 night flying is conducted below 200 feet. Equipment installed: RAAWS and doppler. The H-2 NATOPS Manual *prohibits* night and instrument flying without an operative RAAWS.

Navy VERTREP H-46 — Environment and Equipment. Night embarked operations are primarily conducted from MLSF ships (i.e., AE, AOE, AOR, and AFS), with flight decks ranging from 25 to 45 feet above the water. *All night vertical replenishment is conducted below 200 feet.* Approximately 80 percent of all embarked night flying is conducted below 200 feet. Equipment installed: basic instruments, including radar altimeter. **No doppler and no RAAWS.**

To make a comparative analysis of the H-2, H-3, and Navy H-46 helicopters, the following statistics reflect mishaps occurring from 1969 to 1981. These statistics represent only those mishaps that:

- Occurred at night.
- Resulted in water impact.
- Happened primarily because of pilot error only, not mechanical failure.

Night Mishaps (1969—1981)

	H-2	H-3	H-46
NAVAIRPAC			
Embarked	2	3	4
Disembarked	1	0	1
NAVAIRLANT			
Embarked	1	3	3
Disembarked	0	3	0

Flight Hour Summary (1969 — 1981)

	H-2	H-3	H-46 (VERTREP)
Total	403,228	1,028,385	216,832
Embarked Hours	129,572	330,012	97,574
Embarked Night Hours	38,871 (30%)	99,004 (30%)	17,563 (18%)
Embarked Night Mishaps	3	6	7
Embarked Hours Per Night Mishap	12,957	16,500	2,509

The statistics to the left certainly add credence to the opening statement of this article. This mishap rate is particularly alarming when one considers that the three VERTREP squadrons (HC-3, 6, and 11) will collectively fly a total of over 4,000 hours of overwater night time this year. If history continues to repeat itself, it seems entirely predictable that at least one and perhaps two mishaps will occur every year.

Now that this safety hazard has been identified, there remains the most important question. Why have mishaps of this nature impacted the Navy H-46 community at a rate five and six times greater than the H-2 and H-3?

An argument could be made regarding the quality of training provided by the H-2, H-3, and Navy H-46 training pipelines as well as follow-on training provided by the operational squadrons. The H-46 community is the only one of the three that trains without the aid of a flight simulator. Any correlation between the frequency of mishaps and the lack of simulator training and other training is difficult at best. From my personal experience in training through both the H-3 and H-46 pipelines and flying the H-3 and H-46 in operational squadrons, I tend to be very skeptical of the quality-of-training argument. Certainly a flight simulator will improve the quality of training for H-46 pilots, but I'm not convinced it would have prevented any of these mishaps. **I am comvinced, however, that these eight mishaps would not have occurred had a Radar Altimeter Aural Warning System been installed in the H-46.**

A Radar Altimeter Aural Warning System (RAAWS) is not new to helicopters. It was originally installed in the H-2 and H-3 in 1966. The fact that both the H-2 and H-3 are prohibited by NATOPS from night and instrument flight without a functional RAAWS provides ample indication of the relative importance of this safety device. The RAAWS was designed to alert pilots of impending danger when visual cues did not prove totally effective at night and during IFR conditions. Distractions in the cockpit, breakdowns in crew coordination, and inattention to the task at hand, regardless of a pilot's experience level and professional reputation, have manifested themselves in mishaps throughout the aviation community. In the night low-level overwater environment, you are seconds, not minutes, from disaster. The eight mishaps discussed here are classic examples of such momentary lapses.

Last fall, I read a JAG investigation concerning an H-46 mishap that took place in 1977. The endorsement reaffirmed the need for the RAAWS and estimated that the development would take "3 years and 10 million dollars." Subsequent endorsements on two more mishaps in 1980 and 1981 indicated that an integral low-altitude aural warning device was under development. The plans were to submit a proposed modification to the H-46 for consideration as a FY-84 improvement. FY-84 is too late! The numbers indicate five more mishaps of this nature are likely to be tallied by then.

Fortunately, the countdown to another water impact has been interrupted, or at least the interval has been significantly lengthened. Two events have led to that interruption. First, based on a Beneficial Suggestion by a member of HC-11, a RAAWS has been developed that meets the operational requirements for the H-46 VERTREP environment. The cost in parts is only $26.52. The proposal has been forwarded in the form of an Engineering Change Proposal and has been approved by Commander, Naval Air Systems Command. In December 1982, the first 30 RAAWS kits will be installed. All Navy as well as Marine H-46s will be equipped. Surprisingly, the cost for 300 units will be less than $600,000. The second reason the countdown has been interrupted has been the decisive action and strong support of both our Wing and Type Commander. In light of these problems, they approved a recommendation to restrict night overwater H-46 flights. In essence, this restriction removed the Navy H-46s located in the Pacific Fleet from the night no-horizon environment that has proven so hazardous. It was not a popular decision for fleet commanders, for the H-46 VERTREP capability has been the Achilles heel of extended Western Pacific Operations and particularly those in the Indian Ocean.

The installation of a RAAWS is one of the most important safety additions in the H-46 since its introduction in 1965. In the past, night water impacts have accounted for a large share of the total Navy H-46 mishaps. With the RAAWS installed in the helicopter, there's no question that a substantial reduction in the H-46 mishap rate is not only predictable but will, in fact, become a reality.

According to a recent CNO status report, we're well into the implementation stage. Consider the following: "A Ground Proximity Warning System (OSIP 63-84) provides incorporation of GPWS in 352 CH-46 series aircraft (CH-46A/D/E, HH-46A, and UH-46A/D). A similar program, Ground Proximity Warning System (GPWS) (OSIP 67-84), provides for this modification for 174 CH-53A/D and RH-53D helicopters. Radar Altimeter Readout (OSIP 18-84) will be incorporated in 103 AH-1J/T aircraft. This OSIP provides for an altimeter in the front seat (cockpit) of AH-1J/T helicopters to enable the gunner/copilot to assist the pilot in maintaining proper altitude monitoring during low-level flight. RAAWS and doppler warning have already been incorporated in H-2, H-3, and H-60 aircraft."—Ed.

Two Close for Comfort. Near-midairs are occurring at an alarming rate. Although most involve our guys being zeroed in on by light civil aircraft, occasionally it's an eyeball-to-eyeball confrontation with some blithe spirit soaring in his hang glider or ultralight or heading earthbound in his parachute. But how about the NMAC that's strictly an in-house affair, where we're our own worst enemies? A couple of recent examples are described below:

During a day VFR flight with the MAD towed body deployed, an SH-2F crew sighted an A-7E passing directly under their helicopter with about 100 feet of lateral separation. You'd better believe there were a few "mad bodies" manning that *Seasprite*. The TYCOM had the following to say about this NMAC:

"Regardless of the mission or the control zone in effect, sound judgment and adherence to the basic "see and avoid" principle must always be observed. A high-speed fly-by on an unsuspecting aircraft at low altitude is totally unnecessary. ASW aircraft frequently operate at altitudes that make any evasive action extremely hazardous.

"The fact that one pilot has visual contact on another aircraft does not relieve the pilot of the responsibility to maintain flight separation, e.g., no other pilot should reasonably think that he or his aircraft is endangered. No peacetime mission is so important that it should jeopardize flight safety."

The following investigation recommendations were forwarded by the TYCOM to all addressees for action:

"Take positive steps to ensure that every naval aviator and flight officer is aware that a positive control zone in accordance with NWP-42 exists around every air-capable ship equipped for IFR approaches. This control zone is defined as a circle 5 nm in radius, extending up to 2,500 feet MSL.

"Determine positive action has been taken to ensure fixed-wing aviators are made aware of the extreme dangers involved when flying underneath ASW helicopters, due to the possibility of striking the deployed MAD towed body or MAD towed cable."

The second NMAC involves four players — three A-6s and the NAS East Tower controller. We'll use the following fictitious side numbers to identify the *Intruders* — GG-100, GG-115, and GH-100.

GG-100 was in the VFR traffic pattern, performing touch-and-go landings. After completing the third touch-and-go landing to Runway 32L, GG-100 took up a pattern interval on another squadron aircraft, GG-115, that had just completed a PAR approach and landing on Runway 32R. GG-100 was about 2 miles in trail of GG-115, which was 2 miles in trail of GH-100. At this time, both GG-115 and GH-100 switched to tower frequency to request entrance into the VFR pattern. GH-100 then made two calls to the tower for a turn downwind but received no response or acknowledgement from the tower. At 3 miles, GH-100 made a third call and was cleared downwind by the tower. GG-115 also made several calls to turn down-

wind. The tower responded with silence. At 7 nm DME, 115 advised the tower that he was switching to MidEast Approach Control. At this point, GG-100, hearing his squadronmate's (GG-115's) "Switching to MidEast Approach" call to NAS East Approach Control, decided he would attempt to obtain a downwind clearance. NAS East Tower then came back with "Cleared downwind." GG-100 commenced his turn at 1,200 feet, 4 to 5 miles upwind. Passing approximately 170 degrees, the pilot of GG-100 observed GH-100 pass directly beneath his aircraft. GH-100 saw GG-100 as he started his downwind turn. Realizing that a possible midair collision existed, GH-100 increased his airspeed and lowered his altitude slightly. The A-6s missed each other by about 200 feet.

The flightcrews involved stated that the tower controller did not appear to be aware of the positions of all aircraft in the pattern and was using incorrect call signs when giving clearances and instructions (he evidently didn't realize he had two 100 side numbers). They also stated that inflight visibility was about 3 to 4 miles and the pattern had extended beyond that distance. In the case of GG-115, the pattern had extended outside the NAS East control zone. Confusion was the call of the day, both in the tower and in the cockpits of the three *Intruders.*

This near-miss makes one thing quite clear: any VFR traffic pattern must be limited to the number of aircraft that can be safely controlled within prevailing visibility limits, control zone limits, and air-controller-workload limits. Flightcrews must ensure positive visual contact with their pattern interval before turning downwind, and air controllers must know exactly what aircraft are in the pattern.

Except for the "pucker factor," nothing serious happened as a result of these two NMACs. If these incidents continue to occur in control zones, however, it's just a matter of time before a near-miss becomes a midair collision. Let's get with it.

CHIPs. Returning from a 3-hour cross-country flight, an HH-46's chip detector light illuminated. The HAC declared an emergency to approach control while the H-2P performed NATOPS emergency procedures for an imminent transmission failure. No secondary indications were visible.

The pilots decided that the 10-mile flight to the nearest airport (municipal) was too far and elected to make an emergency landing to the first safe, available spot. This turned out to be a farmer's field, where they made an uneventful landing.

While on the ground, the aft and forward chip plugs were pulled and inspected. No one could see any metal flakes. The plugs and filters were then cleaned and replaced. Even after a 15-minute ground turn, no metal showed up.

The pilots decided to fly to the municipal airport, which could provide better facilities for more indepth troubleshooting. The flight was flown "low and slow" in accordance with NATOPS, and the landing was fine.

After landing, the plugs and filters were again inspected. The forward transmission filter had shiny flakes in it, as did the chip detector plug. The quantity and size were insufficient to illuminate the warning light, however. Though they wished they could get home, the pilots decided that further flight was inadvisable, and the transmission was changed.

A component was deteriorating inside the transmission, and had it failed in flight or on the ground, there could easily have been a flight mishap.

Once again we have an example proving that there's no substitute for good judgment. The cautious response of this alert and knowledgeable flightcrew earns them a "Cool Helicopter Inflight Pilots" (CHIPs) award.

The fateful (fatal?) difference

By LT R. A. Wall and
Dr. M. S. Borowsky
Naval Safety Center

Nighttime Off the Coast of Florida. The nugget is holding short for the cat. (Sweaty palms are OK on the fourth night cat shot of your life.) Taxi signals, inch her forward, in position. The A-7 screams to life as the young pilot advances the throttle. Last scan, feels good, lights on, breathless, smooth stroke, airspeed, attitude, gear, attitude, 15 degrees angle of bank *(steady her out),* 10 degrees nose low *(bring her back),* 30 degrees angle of bank *(what the heck?),* 50 degrees nose down . . . ( ) . . .

Holes in the water don't smoke.

Early Morning in the Mediterranean. The hop is a scheduled logistics rendezvous with a smallboy over the horizon. To be back on time for another VERTREP evolution, the crew has to meet an overhead time of sunrise, which means launching into a sack of coal dust. After the rotors are spinning, the HAC passes control to the nugget and sits back to watch the "kid" make his first underway ITO. Takeoff checklist, beeps in the hover, pull it in, positive rate of climb, "Watch your attitude (*15 degrees angle of bank*) and your nose (*5 degrees nose up*), OK, smooth it out and bring it back . . . *there (6 degrees angle of bank).* Looking good (*nose on the horizon*)." The crew makes it back in time for their scheduled VERTREP.

Here are two young aviators of equal experience, performing similar tasks under difficult conditions, and yet, there exists a fateful (fatal?) difference.

In our quest for the holy grail of safety, we amass tremendous piles of information on scenarios that have led up to mishaps. We then painstakingly dissect each one, looking for similarities that should be avoided in the future. If a certain pilot action, whether precipitating a mishap or merely coincidental to it, appears in too many mishaps, there may be cause to question its use.

What went wrong, where it went wrong, how it got broken, and why it wasn't fixed are the soul-searching questions asked of preventative safety.

Another line of questioning, of equal and possibly greater importance, is: *how did they know to do that?* or *how did they pull that one off?* In other words, the analysis of all those "almost" mishaps that never were: the minute study of *near*-Class As to find out what someone did *correctly.*

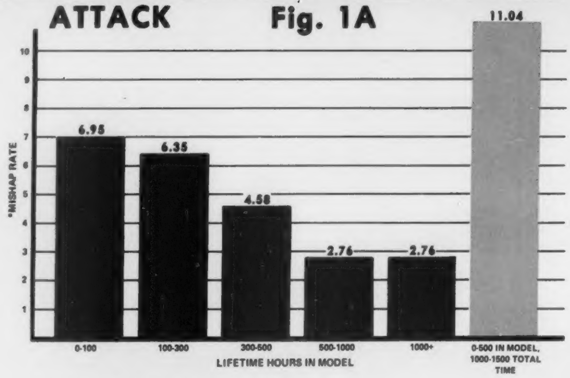
Like your flight plan, the second line of questioning looks terrific on paper, but wait until you launch and actually try to get from point A to point B. Even with our nonpunitive hazard reporting system (which includes items like near-misses, physiological episodes, and "things that go bump in the night"), the number of "almosts" that eventually make their way to the Safety Center is scant at best. (As it was back at Whiting, we theorize that for every Class A (down) we receive, there are at least 10 we could have received.) So here we are, back at the Numbers Palace of the East, interrogating with our second line of questioning and getting answers to the first.

Maybe those answers can yield the "almost" answers if we look at them the right way. About 8 months ago, we began a study to try and accomplish this: given the data on mishaps, arrange it in such a way that one can see the things pilots are doing correctly. The installment parts of the study, the graphs that have appeared on the inside back cover of the last three issues of *APPROACH*, tell the story of what pilots are doing *incorrectly.*

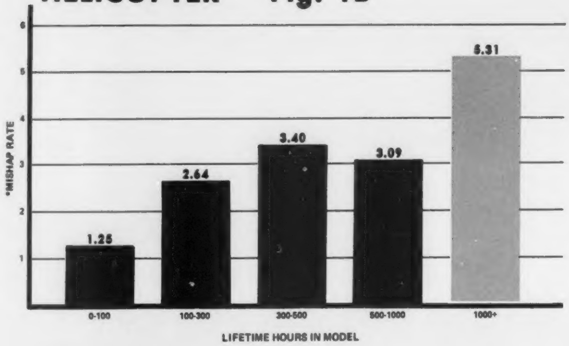
Taken discretely, they are valuable because they tell a particular pilot what his peers, with similar hours in type and hours in the past 30 days, have done before him — pilot actions and scenarios to watch out for. The real money is made, however, when all the communities are shown, one against the other. For example, as the bar graphs at the far left of Figures 1 and 2 ask, what is it that helo pilots with fewer than 100 hours in type or fewer than 10 hours in the last 30 days are doing correctly? (Before you jump to the obvious conclusion of *flying with another pilot,* look at the bars at the right side of the same figures and ask why these "old hands" with over 1,000 hours in type and over 40 hours in the last 30 days have high rates and disappointing trends!)

Before we conjecture on the sum of the parts, let's review the idiosyncrasies and trends of the individual communities.

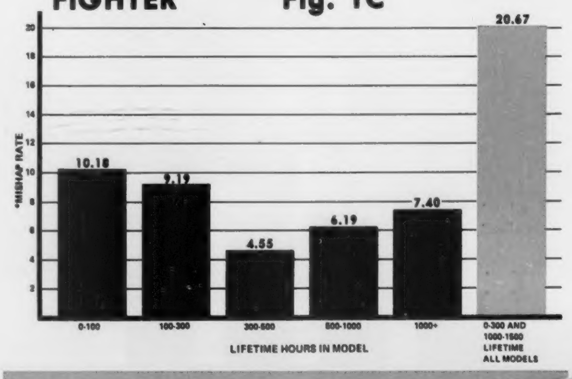
ATTACK Fig. 1A



HELICOPTER Fig. 1B



FIGHTER Fig. 1C



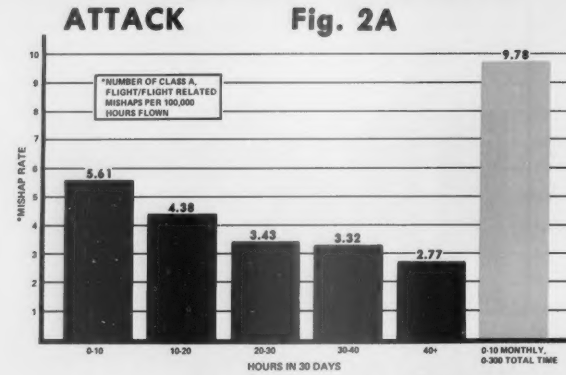
The Attack Profile. Here, research and theory go hand-in-hand. Mishap rates decrease as pilot experience and proficiency increase. This represents a classic learning curve for both total hours in model (Fig. 1A) and hours in the last 30 days (Fig. 2A). The rates are particularly high for pilots with fewer than 100 hours in model or fewer than 10 hours in the last 30 days. Uncontrolled flight and offensive maneuvering are the flight regimes that present the major problems to aviators with fewer than 100 hours in type, and violation of rules, regulations, and NATOPS appears to be the No. 1 problem for those with fewer than 10 hours in the last 30 days. The pilots with the highest mishap potential seem to be those with 1,000 to 1,500 lifetime hours in all models *and* 0 to 500 hours in type (Fig. 1A) and those with 0 to 10 hours in the last 30 days *and* 0 to 300 hours in model (Fig. 2A).

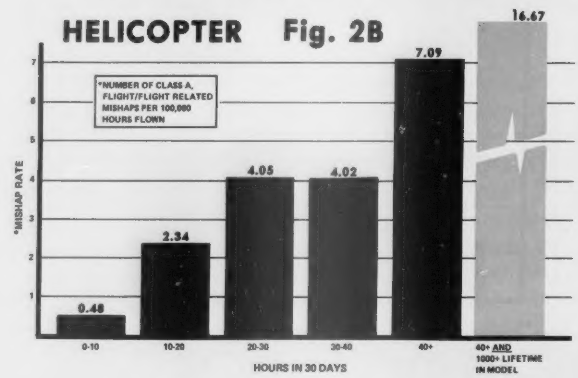
Continued

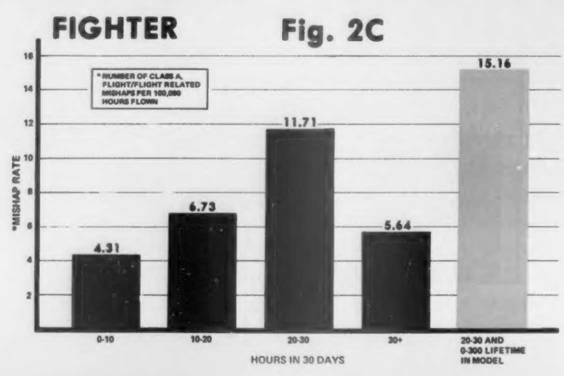
The Helicopter Profile. Since increased experience and "proficiency" result in higher mishap rates, research and theory appear, at first, to be at odds in this community. An inverse learning curve is demonstrated here, where pilots with over 1,000 hours in type experience a fourfold increase in the mishap rate over pilots with less experience, e.g., 0 to 100 hours in type (Fig. 1B). Pilots with over 40 hours in the last 30 days have a higher mishap rate than those with fewer than 10 hours in the last 30 days by a factor of 14 (Fig. 2B)! At both these experience levels (over 1,000 hours in model and over 40 hours in the last 30 days), the leading cause of mishaps is inadequate flight preparation. Other factors include violation of rules, regulations, and NATOPS as well as faulty performance of the other pilot. The pilots with the highest mishap potential are those with over 1,000 hours in type and over 40 hours in the last 30 days (Fig. 2B).

The Fighter Profile. Here research and theory either go hand-in-hand or are at odds, depending on who you talk to. As lifetime hours in model increase, a reduction in mishap rates is evident until accumulated hours exceed 500. At this point, the rates increase and continue to follow the inverse learning curve. This rise appears to be due in part to an increase in judgment errors (Fig. 1C). The mishap rate profile for hours in the last 30 days begins as an inverse learning curve that peaks at 20 to 30 hours and then declines as hours exceed 30. The major problems at the peak are failure to maintain flying speed and poor CV/FCLP landing technique (Fig. 2C).

The pilots with the highest mishap potential are those with fewer than 300 hours in model who also have 1,000 to 1,500 lifetime hours (Fig. 1C) or 20 to 30 hours in the last 30 days (Fig. 2C).







The Multiengine Profile. The mishap profile for multiengine pilots (which appears on this month's inside back cover) has been presented in a different format from that for the other three communities. This was necessary because the number of mishaps experienced by this community is such that a statistically valid data base cannot be defined in the same way that one can for the other aircraft classes. In lieu of pilot factors as a function of experience and proficiency, the data is presented for pilot factors as a function of how often a certain factor is implicated in mishaps. For Class A mishaps, the leading pilot factor is judgment error, which occurs in nearly 40 percent of these mishaps. Specifically, the problem appears to be failure to recognize a dangerous situation and take appropriate action. Additionally, 47 percent of all Class A mishaps occur during the landing phase. For all flight/flight-related mishaps (Classes A/B/C), the top factor is again judgment error: failure to properly judge closure rate is the highest specific problem. Forty-one percent of all Class A/B/C mishaps occur during the inflight phase.

Many mechanisms have been proffered to explain the learning curve disparities from community to community. Among these are differences in mission, aircraft handling characteristics, and operating environment. While these factors must definitely be considered, they still fall short of explaining the disproportionate manifestations of the inverse learning curve: both inter- and intracommunity. One of the interesting theories under study deals with the dynamics of the psychological environment in single pilot vs. multipilot situations. In the case of the helicopter community, could it be that the same two-pilot crew concept that keeps an aviator out of trouble is also responsible for the "Oh well, if I can't do it, the other pilot will pull us out" syndrome that develops as pilot experience grows? Could it also be that single-seat aviators experience a higher mishap rate initially, since there's no one to intercede as the situation deteriorates? In this scenario, the acquired self-reliance built through experience and proficiency could lead to the healthy realization of the "it's me against the world" feeling and result in a lower mishap rate. The dynamics of a cockpit with a pilot and a flight officer would seem to fall in the middle, somewhere between a two-pilot cockpit and a one-pilot cockpit. The fact that the mishap rates and learning curve distribution (for aircraft with predominantly this type of crew) also fall between the other two may be no coincidence. In essence, the mechanism we are seeing may be the dynamics of a crew concept (or the lack of one) and the manner this manifests itself as a function of varied experience and proficiency.

This theory is still under study, and concrete answers or recommendations will not be forthcoming for some time. Until then, the graphs for your community can tell you what's wrong, and the graphs for all the communities may point the way for what is right.

In any case, can you afford to wait until our studies are complete to think about how you can be affected by the fateful (fatal?) difference?

ALMOST

By ENS Tony Redd
VA-42

"Landing checks — harness locked, armament switches are off/safe, flaperon pop-up and anti-skid are on, hook is up, three gear down and locked, flaps are in takeoff, stabilizer shifted, slats down, speedbrakes are out . . . WE'VE LOST AN ENGINE!"

MY pilot and I were scheduled to lead a division of A-6s in a close-air support mission at the Chocolate Mountain target range near NAF El Centro. Little did I realize when we briefed that morning that my first mission with live ordnance would end with my first actual emergency!

The exercise was to be the culmination of 8 days of intensive visual weapons training for fleet replacement pilots and bombardier/navigators. It was our first opportunity as a CAT I flightcrew to plan and lead an *Intruder* strike with live ordnance and demonstrate our newly-acquired prowess in iron-sight bombing.

The brief was detailed and thorough. One of our greatest concerns was the high-gross-weight takeoff (carrying 10 MK 82s and a full bag of fuel) with runway temperatures in excess of 100° F. We emphasized takeoff data while paying particular attention to single-engine climb performance. We also covered single-engine landing procedures, noting that at our field elevation and temperature, a single-engine landing could be accomplished at only 2,500 pounds above the A-6's basic, dry weight. Certainly a number worth remembering.

Launch and rendezvous went smoothly, and we contacted our FAC upon arrival at the target. The bombing portion of the flight went as briefed. Watching those 500 pounders do their thing for the first time was a real thrill. The flight continued smoothly, and with the ordnance expended, we jubilantly rejoined off target for the return to base.

Approaching the field with the flight, we were cleared for a left break at the numbers. Passing through approximately 135 degrees of turn following our smartly-executed break, we lowered our gear and flaps. Then we heard an abnormal noise and felt a slight vibration but attributed this to the nose gear lowering and locking into place. We began the landing checklist and scanned the integrated position indicator. "Landing checks — harness locked, armament switches are off/safe, flaperon pop-up and anti-skid are on, hook is up, three gear down and locked, flaps are in takeoff, stabilizer shifted, slats down, speedbrakes are out . . . WE'VE LOST AN ENGINE!"

With our starboard engine indicating zero RPM, we leveled the wings and went to MRT on both throttles, simultaneously bringing in the speedbrakes. We soon realized this wouldn't work, since the VSI was indicating an increasing rate of descent. Immediately, we raised the landing gear handle. The 7 seconds it took for the gear to fully retract seemed like minutes. As the aircraft was nearing 800 feet, a small but highly gratifying 200 foot-per-minute climb appeared on the VSI. With a positive single-engine climb established, we flew straight ahead. ("Whew, I can breathe again. Looking better now!") There was no need to jettison empty MERs or droptanks with our positive rate of climb. Once I realized we were going to be able to keep the ailing *Intruder* airborne, I took out the NATOPS PCL and started through the applicable checklists. Climbing through 5,000 feet, we started dumping our extra fuel (remember our brief — only 2,500 pounds of fuel for single-engine landing!). Since the engine was indicating zero RPM, we determined that an airstart wasn't possible. Reviewing single-engine landing procedures once again, we dumped fuel, burned down to single-engine landing weight, dirtied up, and began our descent for a straight-in approach. Everything was ready: LSO on station, crash crews standing by, aircraft appropriately configured, checklists reviewed and completed. The approach went exactly by the numbers: flaps and slats down, speedbrakes in, slightly fast approach, LSO talkdown to an "uneventful" arrested landing. On postflight inspection, it was easy to see why the engine read zero RPM — the turbine section had disintegrated and the engine had seized.

Fortunately, this incident didn't result in the loss of an aircraft and crew. Still, the potential was certainly there. Perhaps the most important lesson I learned is to underscore the necessity for a complete and thorough brief prior to every flight. By briefing and understanding possible emergency situations, we *were* prepared. Also, I'm glad I learned early in my flying career that the old axiom "Aviate, Navigate, Communicate" really works. Through strict adherence to emergency procedures and attention to priorities, we were able to keep our aircraft airborne in the midst of a time-critical emergency situation. Finally, the teamwork among all concerned — our wingman, LSO, tower, crash crew, even the teamwork within our airplane — was a definite factor in the highly-successful and uneventful conclusion to what otherwise could have been a tragic flight.

Pictured from left to right, AW3 Eric J. Nelson, LT Robert H. Magee, and LCDR Rickey E. Shook. Not pictured, AW3 Scott S. Sivak.

LT Bob Magee
LCDR Ricky Shook
AW3 Eric Nelson
AW3 Scott Sivak
HS-11

WHILE entering a night ASW hover, LT Bob Magee and his crew experienced a power loss on the No. 2 engine of their SH-3H. At 50 feet and 10 knots, the second crewman, AW3 Eric Nelson, reported seeing a shower of sparks fly from the No. 2 engine exhaust. LT Magee promptly started a climbout to a safe single-engine airspeed and altitude. As he applied power, however, the affected engine entered a full compressor stall. Faced with a steady decline of rotor RPM under the most demanding low-level instrument conditions, LT Magee and his copilot, LCDR Ricky Shook, executed a flawless single-engine waveoff. LT Magee stabilized the decaying rotor RPM and increased airspeed through the judicious manipulation of collective pitch and aircraft attitude while his copilot simultaneously set full power and initiated fuel dumping. Once a

BRAVO ZULU

safe altitude and airspeed were reached, the crew retarded the failing engine to minimum governing speed, eliminating the compressor stall. They declared an emergency and flew the aircraft back to the USS AMERICA for a flawless night single-engine landing.

Postflight inspection revealed a catastrophic power turbine failure. The decisive action and teamwork exhibited by LT Magee and his crew in this *extremis* situation prevented the loss of an SH-3H helicopter. Their professionalism under the most demanding flight conditions was most commendable.

LT Al Yoder
VA-72

LIEUTENANTS Al Yoder and Steve Bartie of VA-72 launched from USS AMERICA (CV 66) in their A-7E *Corsairs* for a routine bombing hop on a spar. With 45 minutes remaining until the scheduled bomb time on AMERICA's spar, LT Yoder led his section south of the CV for a secondary mission of Surface, Sub-surface, Surveillance, and Control.

Sixty-five miles south of AMERICA, at 14,000 feet, LT Yoder noticed the flashing MASTER CAUTION symbology in the HUD. The engine oil warning light illuminated and the oil pressure gauge decreased immediately to zero, confirming a "no oil pressure" situation. He set engine power at 85 percent and extended the EPP in accordance with NATOPS.

After notifying his wingman of the situation, LT Yoder squawked EMERGENCY, then called the air boss aboard AMERICA. Heading his *Corsair* directly toward Roosevelt Roads, the divert field, he advised the air boss of his intention to land there unless he could confirm a ready deck. His wingman, LT Bartie, coordinated via UHF with Roosevelt Roads tower, advising them of the emergency and of LT Yoder's intention to make a field arrestment. Meanwhile the air boss made a ready deck and gave LT Yoder a "Charlie." The divert field was 100 miles away as opposed to the 25 miles to the carrier.

LT Yoder descended toward AMERICA using his speedbrake to set up a 10-mile visual straight-in approach and planned on a 2-mile dirty-up. At 9 miles a "Mayday, Mayday" was broadcast over tower frequency, and LT Yoder watched as the alert helicopter entered the water abeam the CV! Now the air boss had two emergencies on his hands. LT Yoder continued his approach and lowered the gear, hook, and flaps at 2 miles. He was arrested on the No. 2 wire, just as his engine began to seize upon application of military power! It had been 15 minutes since the oil pressure of his *Corsair* had dropped to zero.

LT Yoder's professional response and the superior performance by his wingman, the LSOs, the air boss, and the entire AMERICA team saved his aircraft from a watery grave.

P.S. The alert helo, after making a single-engine water landing, was later flown back aboard the carrier on one engine. That crew has also been recommended for a Bravo Zulu.

"It quickly became obvious that I'd never recover. Passing through 9,500 feet, I positioned myself for ejection, pulled up the guards on both sides of my seat, and squeezed the trigger."

SPINOUT!

By Richard A. Eldridge
APPROACH Writer

An undiscovered and untested flight regime

WITH the above thoughts passing through his mind, an experienced fighter pilot was forced to eject from an F-5E that was in an inverted flat spin.

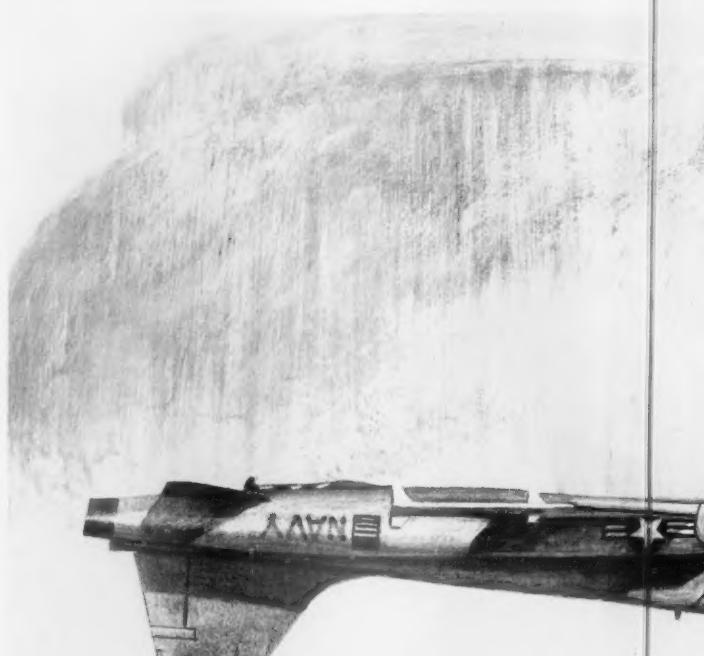
The flight was scheduled as a refresher performance comparison between an F-14 and an F-5E. It was to be an eyeball calibration and demonstration of relative aircraft performance in a noncompetitive atmosphere.

The last segment of the training flight was to be a rolling scissors maneuver. At 18,000 feet, as the F-14 reached a position at 7 o'clock high, the F-5 pilot commenced a 4 to 5G pullup in burner with flaps up. The pullup was oblique and 30 degrees left of purely vertical in order to keep the F-14 in sight. The F-14 was at the F-5's 6 o'clock position.

At approximately 250 KIAS, the F-5 came over the top and continued toward the horizon. Approaching 20 to 30 degrees above the horizon (inverted and slightly left wing down with full aft stick), the F-5's nose movement stopped. With 150 KIAS, the pilot looked at his gauges to see if he could discover why the nose had failed to fall through the horizon. His altitude was about 21,000 feet.

"I assumed I was encountering an inverted pitch hangup, which I had seen numerous times before in practice and actual maneuvering flight. Ensuring I had full aft stick with all other controls neutral, I checked for flaps up. The nose continued to hang up, and the aircraft began to roll right, toward level flight. As I came within 30 to 45 degrees of level flight with a 10 to 15 degree noseup attitude, the roll seemed to stop and my nose began to fall through toward the horizon. My impression was that recovery from the unusual attitude was imminent, and I prepared to assume a steep nosedown attitude. With this in mind, I retarded power from afterburner to MILITARY or slightly less. The nose continued to pitch past the 90-degree nosedown position, however, and continued to the horizon, leaving the aircraft inverted with one negative G. It immediately began yawing right at a moderate rate. *I'd entered an inverted flat spin to the right!*

"Neutralizing the controls, I put in full aft stick and again checked that flaps were up. My heels were firmly on the deck, and my toes were on the rudder pedals, which were squarely neutral. Based on debriefs of inverted spins, I expected from four to six turns before a nosedown recovery.



"After the first few turns, I checked the altitude at 16,000 feet and again ensured I had full aft stick and flaps up. Placing the emergency flap handle in the up position, I took my feet off the rudders to check for neutral controls and put my toes back squarely on the pedals. The yaw rate had stabilized at a moderate rate. From horizontal appearance, my impression was that the spin was exactly flat — inverted!

Observing no pitch oscillations, I determined that, according to NATOPS, 10,000 feet would be my decision altitude.

"When my F-14 playmate called '10,000 feet,' I saw approximately 11,000 feet on the altimeter. I thought 'one last chance' and jabbed the stick forward and then fully aft, hoping to induce some pitch moment. Again, my spinning world was flat and inverted. Although I was under a little negative G force and my helmet was pushed against the canopy, I was not uncomfortable — I could have reached any control switch in the cockpit. It quickly became obvious that I'd never recover. Passing through 9,500 feet, I positioned myself for ejection, pulled up guards on both sides of my seat, and squeezed the triggers."

Following the ejection, the pilot was rescued by a SAR helicopter after approximately 50 minutes in the water.

The mishap pilot was combat-experienced with over 3,000 hours in fighter aircraft. His training program was thorough and adequate, and he'd completed a rigorous familiarization and IUT syllabus. His systems and tactics ground school were all-inclusive. He'd accumulated 60 hours in the F-5 during 63 closely-supervised flights. Although he hadn't been to the formal spin school, he'd received a mandatory F-5 flight characteristics brief, viewed an F-5 out-of-control training film, and taken the required F-5 flight manual tests.

His familiarization flights had included demonstration and execution of recoveries from repeated inverted pitch hangups and tactical situations at extreme airspeeds and angles of attack. He'd received a training squadron lecture series on aircraft spins. The lack of the flight training portion of the spin school was an administrative oversight but wouldn't have changed the outcome of the mishap, as the pilot recognized the spin and applied the correct flight control inputs.

The F-5 was configured with an asymmetric missile load of one AIM-9 missile on the left wingtip. Several thousand F-5 ACM sorties had been flown in this asymmetric configuration without incident, however. Both the F-5 Flight Manual and the F-5E Stall/Post Stall/Spin-Susceptibility Test Report were reviewed. Those publications address aft C.G. and asymmetric loading as factors aggravating inverted post-stall gyration (PSG). It was determined that the mishap aircraft *was* within the limits of aft C.G.

A NASA spin test published 2 years after the F-5E Stall/Post Stall/Spin Susceptibility Test Report highlights results of similar inverted spin and tunnel tests in a configuration similar to the mishap aircraft. Wind tunnel models with light asymmetric loads (single AIM-9) show tendencies to spin in a manner less oscillatory than symmetric models. However, there have been no documented inverted, flat, F-5 spins in actual testing, simulated testing, or in previous flight operations.

The mishap occurred when the pilot lost control of the aircraft while performing a normally routine and safe tactical maneuver. The F-5's airspeed was lower than the pilot had previously experienced in similar maneuvers because maneuvering flaps had not been used and application of full aft stick was delayed. The resulting inverted pitch hangup was aggravated by the low airspeed. *The hangup, departure, and PSG represent a very small window through which the aircraft entered an undiscovered and untested flight regime.* From the point at which the window was passed and the inverted flat spin was entered, the F-5 couldn't be saved using stated handbook procedures. ◄

These are incidents where pilots have taken a snooze and left the flying to the automatic flight controls.

Taps! Taps! Lights out!

By LT Don G. Cooper
VA-147

A CATCC radar controller notices a blip break out from the Marshal stack. A moment later, the concerned controller attempts to contact the aircraft. No luck! Repeated calls receive no answer as the aircraft flies farther and farther away. Finally, after the control room has become more than just a bit anxious, the pilot acknowledges and returns to base.

In another instance, Center calls a squadron to inform them that a returning aircraft has just overflown their base. They've had no contact with the aircraft for the last half hour. As the plane heads out to open ocean, nearby F-106 *Delta Darts* are scrambled to intercept. The pilot finally reverses course and lands with barely enough fuel to taxi to the line without flaming out. Are these instances of severe hypoxia? No. These are incidents where pilots have taken a snooze and left the flying to the automatic flight controls.

Sleep is an essential human function. Despite science's inability to find any physiological and biological need for sleep, no one can do without it, although it has been tried. In 1959, as a promotion stunt, a New York disk jockey, Peter Trip, managed to go 200 hours without sleep. In 1933, a man who'd decided that sleep was a total waste of time enlisted the aid of two psychiatric researchers to break him of this "bad habit." He believed that, if kept awake long enough, he could overcome his need for sleep. He made it for nearly 10 days before the researchers, afraid of his deranged behavior, called off the experiment and let him sleep. Despite his long stay without sleep, he'd succumbed to the need much earlier. On the fourth day of the experiment, typing tests used to measure his functioning abilities were abandoned. He could no longer do them.

The fact that pilots need sleep and rest for proper flying is recognized in OPNAVINST 3710.7: "Pilots should not be scheduled in excess of 18 hours, and rest time should be sufficient to obtain 8 hours of uninterrupted sleep." During these times of reduced manning and expanded workup schedules, this requirement is becoming increasingly difficult to meet.

There are times, such as fleet exercises, OREs, and other demanding operations, when we're pushed to our limits. During these times, the flight schedule can be radically altered and the commanding officer, operations officer, and safety officer (busy themselves) may have a difficult time tracking the full workloads of all pilots.

The one most aware of the situation, the pilot himself, is least likely to think that he can't hack it and raise a warning flag. This problem may have subtle consequences. A recurrent scenario in aircraft mishaps is a pilot's failure to follow normal procedures when distracted by other events. In how many cases is this problem aggravated by fatigue?

Carrier aviators face a difficult environment with regard to sleep and rest. Perhaps more than any other Navy occupation, carrier aviation requires a very high degree of fitness and alertness, yet this same environment demands odd flying hours, disrupted daily schedules, and watchstanding on top of never-ending paperwork. When there *is* time for sleep, fliers are faced with the incredible noise of aircraft catapulting off or landing just inches overhead. Steaming hot temperatures, airmen chipping paint, and bunkmates switching on all the lights (or banging open drawers in the dark, trying not to be a disturbance with the lights on) compound the problem.

The biological function of sleep is still largely unknown. It must act in some sort of restorative manner, but no chemical or physiological differ-

PH3 Steve Webb

ence can be found between a sleepy person and a rested person. Neurological research has shown that sleep is not just a passive unconsciousness. Instead, it's a very intense physical activity of great complexity.

There are various stages of sleep, and although everyone has his own distinctive sleep behavior, sleep does have a classic pattern. There are several stages in the pattern, each progressively harder from which to wake someone.

Sleep moves through each stage until REM sleep is achieved. REM stands for Rapid Eye Movement, and this phenomenon is characteristic of profound sleep and is probably correlated with vivid dreaming. Though the deepest sleep, the REM stage includes intense brain activity, as in an awake state. Oddly enough, the body is almost immobilized during this period. After the REM stage, the sleeper goes back to a lighter stage and the cycle repeats itself (but in changing duration) throughout the night.

REM sleep seems to be the essential portion of sleep, and without it, one will still feel tired and out-of-sorts the next day. An average middle-aged male spends about 40 percent of his sleep in the REM stage. One doesn't have to be awakened at night to lose sleep. A loud

noise at the wrong time can interrupt REM sleep and induce a lighter form of sleep. Sleep value is then effectively lost.

What happens when sleep is disrupted or deprived? The most obvious result is fatigue. This can be very demotivating. Long-term sleep deprivation can cause severe problems like delusions, hallucinations, and psychotic behavior. The body can normally cope with small losses of sleep (where the resultant problems are subtle and less severe), yet, when applied to a cockpit, those same subtle problems can become dangerously magnified.

What if a pilot were about to go flying and someone offered him a drug that would reduce his reaction times, distort his perceptions, and reduce his visual acuity? He'd not only say "No" but "Hell, no!" Would this same professional aviator, having a 0400 brief in the morning, say no to the late movie or excuse himself from a late game of cards? The effects would be similar.

The most noticeable effect of sleep loss is the disruption of timing flow, the way the brain time-coordinates the various movements of the body (hand-to-eye skills, stick and throttle reaction to the ball).

This is the reason athletes and their coaches value sleep so highly. Professional tennis player Chris Evert-Lloyd describes sleep as her "number one priority," and here, her best means top-notch tennis. She may have several thousand dollars riding on a single return, but what does an aviator have riding at three-quarter miles on a night approach?

What can we do? Jets are noisy and ships are hot, loud, and crowded. Fast-paced operational commitments are necessary to hone the edge of the "sword." As leaders and managers, those of us who control the lives of others must be cognizant of human needs and work for them in the best ways we can. Recommendations for sleep must not be gaffed off. Unconcerned shifting of a flier's work routine and sleep schedule several days in a row is poor personnel management.

Doctor Wilse Webb, a leading sleep researcher at the University of Florida, writes: *"We are homogenizing the 24 hours of the day and arbitrarily turning people off and on around timeless, insatiable output demands. As a consequence, the biological nature of man is being unnaturally bent, and all of his accrued adaptive systems are being affected."* Is it any wonder that the accident at Three Mile Island was caused by human error at 0400 by a night shift crew that had undergone a series of recent shift changes?

The human sleep cycle affects many bodily functions that are timed throughout the day. If sleep schedules are disrupted, cycles of body temperature, memory sharpness, cell division, hormone release, kidney function, blood pressure, digestion, and the levels of sodium, potassium, and brain chemicals are disrupted as well. Once disturbed, these "circadian rhythms" take 1 to 2 weeks to reestablish. A man who has had his sleep disrupted for several days is an accident waiting to happen. He can't possibly give "110 percent" when he isn't up to 100 percent!

Despite all the external problems of sleep, the major problems reside within the individual. We tend to have bad sleep habits, eat incorrectly, and do many things that make sleep all but easy when the time comes.

Midrats before sacktime will help pacify the stomach, but a chili burrito or pepperoni pizza is not the way to go. Those dry hamburgers may need to be washed down, but not with five cups of coffee. Not only coffee, but tea, chocolate, and most soft drinks contain caffeine. After a long, tiring day with a mild tension headache, a few aspirin tablets might seem just right before going to bed, but some aspirin pain relievers also contain caffeine levels that give them that "fast, fast relief."

A little nightcap is also of little help. Although the depressant effect of alcohol may induce sleep relatively quickly, the sleep throughout the night is generally less deep and more erratic.

John Wesley Harding, the notorious outlaw and sidekick of Billy the Kid, is purported to have shot a man one night for snoring. After some of the roommates I've known, I don't blame him. Too bad he didn't have the earplugs we have now, or some cowboy could have seen a few more years. Foam earplugs are extremely comfortable and block noise well.

As mentioned earlier, a sharp noise can disturb sleep yet not awaken the sleeper. A way to block this type of noise is with the addition of "white noise." The constant drone made from a fan or air conditioner is a great way to desensitize the ear from occasionally sharp inputs. Aboard ship, another great way to reduce noise is to go up on deck and erase the little X above your rack so the plane captains won't know where to drop the tow bars and tiedown chains in the middle of the night.

Finally, emotional states can have a great effect on sleep. Before turning in for the night, don't:

- Review in your mind the chewing out you got earlier from the skipper.
- Take a gander of the foldout for Miss Wesson Oil 1982.
- Think about next month's money problems and the wife at home with the kids and credit cards.
- Ponder the consequences of all-out nuclear war.
- Worry about the report that you haven't started but was due yesterday. . .

Instead of contemplating such frustrating issues, wouldn't it be better to read a novel or work on updating your latest "exciting" PQS cards? (They provide a guaranteed passage to dreamland.)

By the way, if it's late at night and you're still reading this article, put it down. It's over, anyway. Get some sleep. You'll appreciate the faster reaction times during tomorrow's launch, when you'll really need them!

A Navy Chaplain? *On the flight line?*

By LT M. T. Hall, CHC, USNR
MAG-26

NO matter how great a flier you are, no matter how many Gs you can pull, you shouldn't take your problems aloft with you. With this in mind, have you ever considered making your chaplain a vital member of your aviation mishap prevention program?

In today's Navy, chaplains are professionals in the arts of pastoral care, counseling, and providing religious ministry to people who desire that service. These are "routine" but essential functions, and commanding officers task their chaplains accordingly.

But why should chaplains be involved in your command's aviation safety program? Aren't chaplains needed more in other areas? Not really. Data in the September '81 issue of *APPROACH* indicates that fliers who were at fault in a mishap were more likely than those not at fault to show signs of immaturity in judgment, have marital problems, experience major life decisions (such as becoming engaged or married), and have difficulties in interpersonal relations.

Any one of these problems can plague all of us at one time or another, and some people have more than their fair share. Sadly, many aviators fail to open up to someone in the helping profession until it is too late.

Being part of a squadron's structure allows a chaplain to become intimately involved with the aircrews and assist them in their crises in life. Mishap prevention should be every chaplain's concern in support of the command's mission.

From a chaplain's standpoint, the key to successful rapport with the troops is identification . . . *being where the people are*. This important relationship can be established in three ways. The first two are absolute necessities, the third is desirable.

The first method of identification is to allow your chaplain to speak at safety and training meetings, with the presentation centering on a personal approach to specific aviation problems. For example, two of the lectures I present are titled "How to Handle Conflict Before it Handles You" and "Communication: Key to Your......" These presentations are shared with not only operational aircrewmen, but also with students at the Aviation Technical Training Center.

The lecture on conflict defines the subject as a normal and recurring event in our lives. Conflict comes from various sources: family problems, financial problems, personal problems. My goal is to make aircrewmen aware that, if not properly handled, conflict can hurt you both in the air and on the ground. I use the Biblical account of David and Bathsheba as an illustration. The communications lecture stresses barriers to communication and ways to overcome communication difficulties. The Biblical account of Saul and David helps to ground this situation nicely.

These presentations have been well received. They afford aviation personnel an opportunity to see a chaplain in a different light, other than that of strictly a worship leader and a seller of religion. A confidence and trust relationship can be built as the crew sees their chaplain as a personal helper.

The second consideration is this: if a chaplain is allowed maximum practical visibility on the flight line, he'll truly "be where the people are." Much counseling can be accomplished at this level. Many fliers won't take the time to go to the chaplain's office, but they will talk with him in their work area.

A third way to increase chaplain identification is to include him in the command's local and area missions. Now, granted, many chaplains already do this on their own, but my recommendation is that the command encourage an area chaplain to actually train with the troops.

I recommend that chaplains be allowed to participate in the command's safety board meetings as well as contribute articles relating to safety to the command's safety newsletter. Such an article could be called the "Padre's Safety Prod." How about including your chaplain in deployment briefs? By following these suggestions, a squadron is ensuring that the chaplain is involved in every phase of command life.

The result of this approach to ministry can be extremely profitable. Your chaplain will be viewed as an integral part of your command and more than just a preacher on the day of worship. Also, communication barriers will be broken down much easier. People confide in others who can say that they've experienced some similar frustrations.

I don't claim to be an expert, and, no doubt, many have come before me with similar interests. But, speaking as a member of the caring profession, chaplains desire to know the people of your command and assist your commanding officer in fulfilling mission requirements. People (fliers included!) are a chaplain's business.

Chaplains are available to assist, listen, cry, and rejoice with you, and the same chaplain who leads divine worship can be a vital part of your command's ongoing mishap prevention program. Don't wait until you're at 30,000 feet MSL, flying at Mach 2.5 through an overcast layer of personal considerations, before you decide to give us a call!

Metal from heaven

Aircraft parts keep falling to the ground, and COMFITAEWWINGPAC is doing something about it.

By Russ Forbush
APPROACH Writer

IN a September 1982 message to subordinate and selected commands, COMFITAEWWING-PAC (Commander, Fighter, Airborne Early Warning Wing, Pacific) addressed a problem of increasing concern to naval aviation — the inflight loss of aircraft parts. The contents of that message follow:

"This week's safety message departs from normal format in order to specifically address an area of increasing concern to naval air. Navywide, the aviation community is plagued with the inflight loss of approximately **one aircraft part per day.** Historically, this wing is averaging one part every 2 weeks. This is excessive and intolerable from a safety standpoint, both on the ground and in the air. The key to more acceptable statistics and the resultant safer aircraft operation is an in-depth look at what is dropping off our aircraft and a command effort to increase maintenance and aircrew awareness of the hazard.

"My message of 27 August 1982 gave notice of a planned survey of this wing's record of falling aircraft parts. During the following week, a wing representative discussed particular aircraft and individual squadron trends in an effort to identify specific corrective actions. Your individual and collective attention to these observations and recommendations will reduce our rate of loss in these areas. Your continued emphasis and awareness will help to identify additional items of concern.

Examples

F-14 Ground Refueling Door. Nearly every wing F-14 squadron has lost one of these doors in the last 18 months. The location of this door makes it an easy preflight item but also allows it to be a significant FOD hazard should it detach in flight. Survey results indicate that some aircraft returning from the fuel pits do not have this door properly secured. This is not the way to do business, especially when associated with night switch crews for FCLP. Doors lost on cross-country flights indicate possible ground crew unfamiliarity and poor preflight inspections.

Ground Locks. Several sets of ground locks have been lost due to the inadvertent opening of the ground lock storage box. An investigation indicates that a worn or missing lid gasket will allow the lid to open even if properly latched. F-14 squadrons should inspect this area closely during all preflight and turn-around inspections and either repair suspect equipment or require the plane captain to retain the ground locks until repair can be accomplished.

Engine Nozzle Leafs. Loss of nozzle leafs has been attributed to excessive play in the attaching cable. This allows the leaf to extend during flight, permitting contact with the speedbrake. Proper adjustment of this cable during engine maintenance should reduce this problem.

E-2 Engine Cowl Panels. Due to their design and location, it is virtually impossible to determine if these panels are secure without physically checking.

Oil Filler Access Panel. A check for proper fastener and attachment during turn-around will eliminate this one. It's a preflight item.

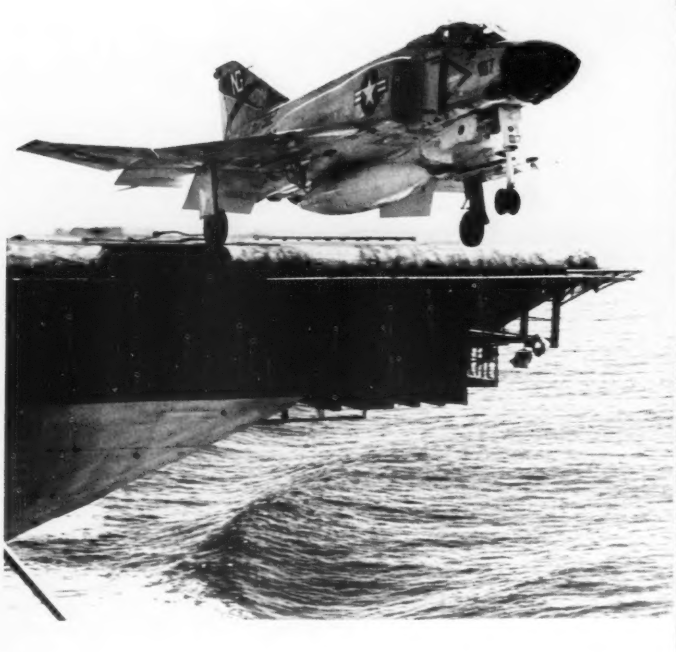
Trailing Wire Antenna and Drogue. There have been inadvertent losses due to material failure and excessive airspeed during antenna operation. Airspeed has now been restricted to 140 KIAS.

F-4 LAU-17A. The problem of LAU-17 separation has been discussed at the squadron and wing level, resulting in recommendations for mounting cam inspection criteria and a review of MIMs for clarity and accuracy.

"It's inexcusable for any aircraft to approach the NAS final checkers for launch with panels not completely fastened. Although monthly final checker statistics show improvement in this area, we are still allowing aircraft to depart their individual squadron lines without being fully prepared for flight. With this in mind, all wing squadrons are directed to incorporate a procedure whereby a qualified troubleshooter will inspect each squadron aircraft prior to its departure from the line area. This is not to be a casual walk-around but a serious and evidently necessary look at all areas germane to this discussion.

"Many lost aircraft parts cannot be identified as design problems but tend to result from our own negligence and inattention to the task at hand. As with reduction in FOD rates, the major reduction in falling aircraft parts will most probably be recognized when we, as maintainers and operators, boost our awareness and understanding of the problem."

We thank Commander, Fighter, Airborne Early Warning Wing Pacific for allowing *APPROACH* to bring to the attention of our readers that wing's problem with falling aircraft parts and the corrective action taken to alleviate the problem. Other aviation communities that have not initiated a similar program should start one. All of naval aviation will benefit.



ICING: how much is too much?

By LCDR S. K. Gryde
VP-65

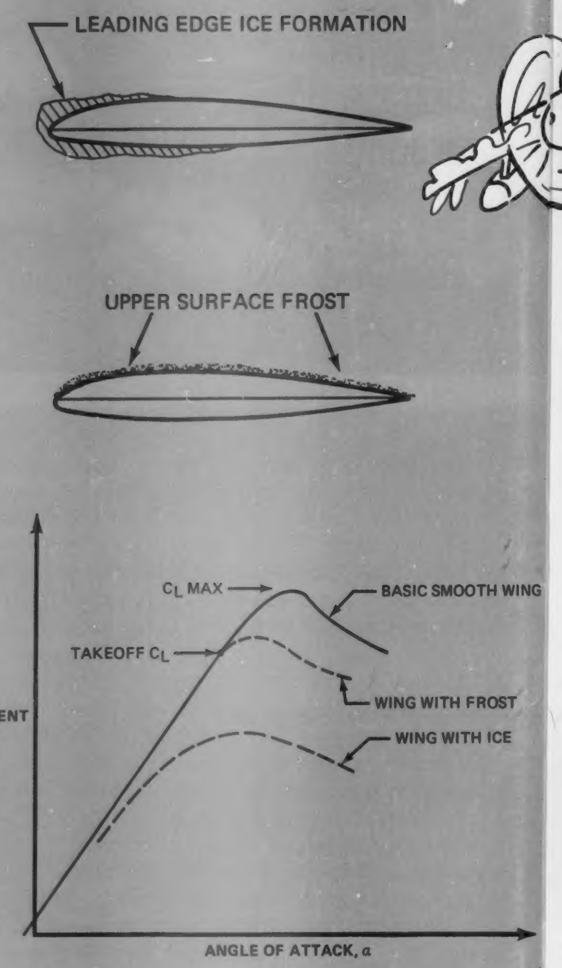


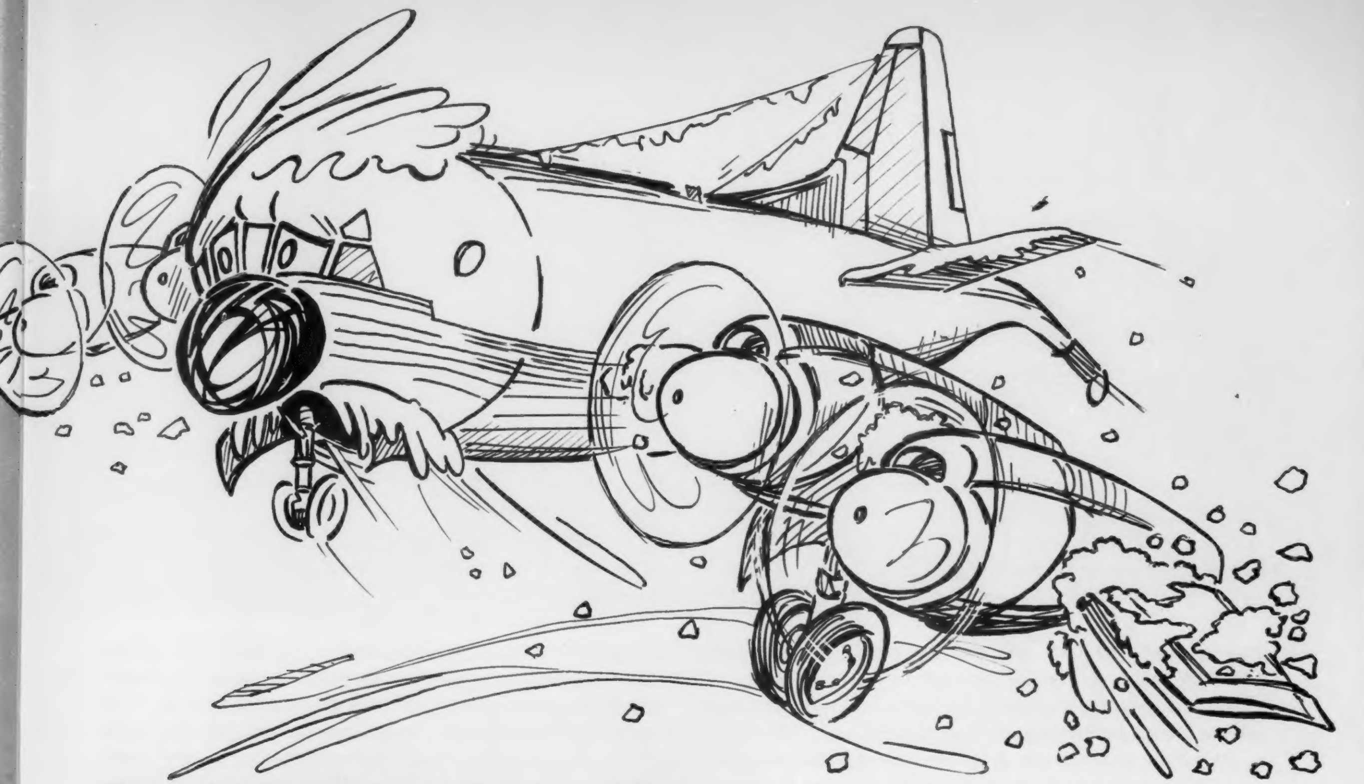
Fig. 1 Effect of Ice & Frost

WHILE reading the NTSB accident report of a recent aircraft crash, I was struck by the fact that the pilots involved seemed so cavalier about the accumulation of ice and snow on their aircraft's wings. It's getting to be the time of year when the frost is on both the treetops and the airfoils, so perhaps a discussion of how much ice is too much is in order.

The All Weather Operations section of my P-3 NATOPS says, "Additional time must be allowed for complete snow removal." This simple, understated sentence is all that is mentioned about snow removal from aerodynamic surfaces prior to takeoff.

A weakness in almost all Navy instructors, whether aviation-oriented or not, is that they presume their students have knowledge of a topic under discussion. How often have you heard an instructor say, "Everyone knows why . . ." or "Of course, as we all know . . ."? Whenever an instructor does this, odds are, no one will raise a hand to ask why. Hopefully, my article will not be subject to this criticism.

The references I read in preparing this article all said the same thing, i.e., "Don't take off with ice on your wings." Obviously, everyone knows this, or do they? Consider these famous last words: "Maybe just a little ice is OK, or maybe



With ice or frost on your wings, you're now the pilot of a new and unique airplane with a wing design that has never been tested.

it's not sticking and will blow off as we accelerate." Would you bet your life on it? Structural ice reduces aerodynamic efficiency. As little as one-half inch of ice on the leading edge of some airfoils can reduce lift by **50 percent.** Even a thin layer of frost can seriously affect the lift-generating capabilities of your wing. Ice or frost disrupts the smooth flow of air over the airfoil, decreases lift, and increases drag, with a resulting increase in stall speed.

As shown in Fig. 1, the coefficient of lift is significantly reduced by ice or frost. Structural ice changes the basic shape of your wing's carefully-designed leading edge. These changes in contour produce severe local pressure gradients that are detrimental to the creation of lift.

Some forms of ice, and especially frost, will roughen the skin surface and seriously reduce the energy of boundary layer air. The kinetic energy of air in the boundary layer is an important factor in determining stall characteristics of an airfoil. Surface roughness results in friction, thus reducing the energy of air in the boundary layer and allowing the airflow to separate from the airfoil at a lower angle of attack.

When separation occurs at lower angles of attack and at lower lift coefficients, vastly different (poorer) flying characteristics result. In other words, with ice and/or frost on your wings, you're now the pilot of a new and unique airplane with a wing design that has never been tested. While the shape of your wing is being changed, you're also adding to the aircraft gross weight with all that ice and snow clinging to your aircraft.

A heavy frost can typically increase stall speed 5 to 10 percent. Takeoff speeds are generally 5 to 25 percent above stall, and it is therefore possible that an airplane with frost or ice will not be able to take off at the desired speed, because that speed is for the airfoil you used to have and not the new one that you're now testing. Moreover, if you're able to get airborne at a minimal speed, you may be so close to stall that light turbulence, wind gusts, or even a simple turn could produce a complete, deep stall.

In the event that you've decided that you don't get paid enough to be a test pilot (so you perform a good preflight to ensure your wings are clear), you're still not home free. As you taxi for takeoff, it could really begin to snow or sleet. Sitting in icing conditions while waiting for a clearance or taxiing is far more dangerous than flying through the same stuff, since ice is accumulating on the total wetted area of the aircraft rather than on just the leading edges. If there's been a delay, you'd better check your wings again. How much is too much? If you can detect it, it's probably too much. (Of course, you could hope it will blow off as you accelerate . . .)

Mishap in a pecan grove

By LT Colin W. Sargent

Seeing the flash of two ejection seats and two good chutes, he watched the fliers float gently into the shock wave.

A STATE trooper was breezing through the shade in his car when he heard a jet-engine whine and an explosion. There, up ahead, over the pecan trees, were two black dots and a pale flash. Beneath the ejected fliers, an F-4N *Phantom* was spiraling toward the ground at 216 knots. Swapping ends (nose and tail) about 2 miles away, it disappeared behind the trees. A moment later, a huge fireball rose several hundred feet into the air. Incredibly, the fliers seemed to be following their aircraft into the ground! Unable to steer their chutes to safety, they floated right down into the billowing smoke and fire.

What the state trooper didn't see was even more distressing. When the ejected crewmembers hit the smoke, they ran into a shock wave from the *Phantom's* explosion. The wave turned the pilot upside down, collapsing his chute momentarily until it blossomed again and, carried by stiff southerly winds, deposited him in a small clearing. On the way down, the pilot was helplessly trying to steer himself away from the wreckage by pulling on his risers. **His Martin-Baker H-7 ejection seat's chute was equipped with the Navy's new FOUR-LINE RELEASE SYSTEM, but he didn't know how to use it!** He'd never received four-line release training, and, for some reason, that fact had never bothered him until he found himself descending gently into the shock wave.

The RIO hadn't had any four-line release training, either. He wasn't as lucky as the pilot. After weathering the shock wave, he was "caressed" by a thousand pecan-tree branches on the way to terra firma.

The state trooper was driving at top speed toward the crash site now, with his siren screaming.

Why did this crew have to eject in the first place? How had their F-4N departed controlled flight?

Let's turn the clock back an hour, to 0830. The mishap fliers and another F-4N crew were briefing for a 1 vs. 1 radar weapons training and ACM flight. After discussing ACM rules of engagement, G limitations currently in effect in the F-4N, and departure/spin recovery techniques, both crews preflighted and took off. Time? 0915. Visibility? Five miles in haze. The flight proceeded to an MOA (Military Operating Area), where the first of several planned radar intercepts was flown. "No sight" was gained.

At the end of the second intercept, the mishap aircraft, ANTLER 14, was in a right turn over the lead aircraft's 5 o'clock position when the leader called, "Passing through 10,000 feet, let's knock it off for altitude."

ANTLER 14, flying at 14,000 feet MSL at the time of the warning, continued in a descending right turn to the breakaway heading while the lead *Phantom,* ANTLER 12, began a left turn to a southerly heading.

Then it happened. When the pilot of ANTLER 14 tried to roll out of his turn, the aircraft became uncontrollable and

began a steep, right, nosedown descent. The ailerons wouldn't respond to stick inputs. Disturbed, the pilot tried the rudders. No joy. The F-4N's initial heading was southeast, but then the nose sliced around rapidly to the right. With wings rocking, the *Phantom* continued toward the earth, gyrating without a hint of purpose.

These problems developed in less then 12 seconds.

Meanwhile, the leader, having not received an acknowledgment to his UHF transmission, reversed his turn and was stunned to find his wingman so far below him and apparently out of control. The lead radioed, "Are you guys all right down there?" to ANTLER 14, just as the aircrew ejected (passing through 5,500 feet AGL). Seeing the flash of two ejection seats and two good chutes, he watched the fliers float slowly into the pecan grove, where the mishap aircraft had spiraled and crashed less than 10 seconds after ejection. Observing the chutes descend, he was "most concerned, since both chutes were drifting toward the fire and smoke area, and one chute disappeared into the smoke cloud, which rose rapidly." By then, he'd already started the successful SAR effort.

Ejection notes. Relying on cabin pressure for a backup, the pilot had been flying with only one side of his oxygen mask attached to his helmet. Because his mask wasn't secured and his chin strap wasn't snapped, he lost his helmet during the ejection and received a superficial contusion to his scalp.

The ejection seat's rocket motor gave him second-degree burns on his left calf because his flight-suit leg was too short to reach the top of his boot.

The RIO's ejection was normal except for difficulty experienced in breathing the emergency oxygen supply contained in the seatpan of his ejection seat's life-support assembly. Removing his mask, he encountered no further difficulties in the descent, aside from chute oscillations and the frustration of not knowing how to use his four-line release system.

Departure from controlled flight. The mishap pilot, with an unsnapped helmet, hanging mask, and cold mike, failed to recognize a deteriorating situation. He inadvertently allowed his aircraft to depart controlled flight at the bottom of the ACM envelope after the knock-it-off-for-altitude call and then failed to quickly recognize the situation, becoming momentarily preoccupied with the lack of flight-control response. In addition, he didn't use the two instruments, AOA and airspeed, that could have given him a positive indication of his departure from controlled flight.

"Departure" is a relatively common occurrence during F-4N fighter maneuvering. Normally, departures will be no longer than a split second, since pilots instinctively relax back pressure, reduce the angle of attack, and regain controlled flight.

It's possible that a recovery from this particular departure could have been initiated above 10,000 feet AGL, even considering the relatively low altitude at entry, but only with *instantaneous recognition* by the pilot and *immediate application of correct recovery techniques*. This departure from controlled flight was not immediately recognized; consequently, the correct recovery techniques weren't initiated in time. Back pressure on the stick was released, but at an altitude too low to ensure safe recovery by the aircrew. **The decision to eject at that point was absolutely correct.**

This mishap dramatically illustrates how close an aircrew can approach the fireball of an exploding aircraft when ejecting overland at low altitude. We recommend that the movie entitled "The Four-Line Release Steerable Parachute System" be fitted into annual static ejection-seat training to ensure adequate aircrew familiarization with four-line release techniques. Moreover, all squadrons equipped with ejection-seat aircraft should be conducting four-line release training on a continuing basis.

If your squadron isn't, you should be wondering why instead of just waiting for the shock wave to hit you! ◄

Egad, I hate night flying

By Maj M. H. Mallett
HMM-365

I'VE heard all the excuses:

"Night flying is the result of an improper preflight."

"At night, the Lurkies chase the Lifties off the blades."

"There's no such thing as a smooth-running radial engine at night. Every glowing chunk of carbon coming out of the exhaust stacks looks like a valve stem." (This was from an old guy who flew H-34s.)

"Night air is bad air. Engine inlet air is white, exhaust air is black. Therefore, white air is good and black air is bad. Night air is black, therefore . . ."

"But it's dark out there!"

I approach night flying with a sense of uneasiness, a feeling of dread. Once in the air, however, I ask myself, "What's so bad about it?" The air is smooth, with no Bernoullis stirring up dust devils and bouncing my helo about. The night is cool, with no sun baking me in my unairconditioned cockpit. The radios are quiet, with just me and a few adventurous souls braving the black, so I don't have to blurt my radio calls under a solid UHF overcast. The city and farm lights give an air of refinement to the Carolina swamps. When it's all over, I say to myself, "You big worry wart, it was nothing to get in a sweat about."

But a small voice keeps whispering, "Egad, I hate night flying." This voice keeps repeating itself like a scratched record (but softly, mind you), and I ignore it until some black night when I'm sitting way up forward on an LPH or LHA and the voice has been joined by a rooting section, all of whom are chanting at full voice, "EGAD, I HATE NIGHT FLYING." I should have no qualms about doing it at night, off a ship. That's my job (though qualms I've got). Aviators have been doing their thing off ships at night for years. So why the sweaty palms, butterflies and, in the back of my throat, the sour taste of wardroom mystery meat? Remember, I'm a helo pilot aboard a Gator Navy ship. In the Gator Navy, things more or less taken for granted on CVs are either not installed or are casualties. Things like:

A meatball (to give you a glide slope)
Centerline lights (to tell you which way the ship is heading)
CCA (to vector you for a good lineup)
HUD (to keep your head out of the cockpit)
TACAN (to tell you where the ship is)
(Catapults, coupled landings, arresting gear, and zero-zero seats are about as useful to helos as air horns, but one would imagine that they take the edge off the terror factor.)

I believe that it was at Kithera where I heard the voice first. Since then, I've heard the voice and its friends many times, all over the world. Kithera is in the Eastern Mediterranian, about halfway between Greece and Crete. Our Amphibious Ready Group was swinging at anchor while a certain Middle East country went *bang*. There were five ships, a couple of US smallboys, and a rotating host of USSR combatants. Our LPH's TACAN was a casualty, awaiting parts from the Smithsonian. The night had no moon, no stars, no clouds, no horizon. All it had was the normal Med haze.

I sat on Spot 1, contemplating the stygian blackness and pondering images like blacker than the inside of a cow, blacker than the IG's heart, blacker than a bowl of ink. . .

Then I pulled into a hover, and words failed me.

Now it's one thing to lift off a runway and go IFR by entering an overcast. There's a bit of transition involved in this action, things like airspeed and altitude. Night shipboard operations dispense with these niceties. First, you're

on deck, next, you're IFR. The difference is only a few feet.

So it's dump the nose, but not too much, pull a bunch of power, and scan like mad. Watch the airspeed and RADALT; they'd better be climbing. Three hundred feet and 80 knots sure look good. Follow the helo in front, see where he turns crosswind, and turn when his downwind passes through your seven. Get lots of interval; 'don't want to bother the air boss with a waveoff.

Now, get established on the downwind. Since the BRC was 270 on takeoff, a downwind of 090 ought to be about right. Right? If you believe this, I've got some investment property down in Florida maybe you'd like to buy. Remember, the LPH is swinging at anchor. The fabled 180 position is likely to be a 90 or a 270 on this particular downwind leg.

There's also the matter of the other ships and identifying home base amidst all the lights. Any approach to an AGI or the *Moskva* is sure to raise eyebrows, blood pressures, and maybe a Navy Blue. Even friendly forces are not good choices; fast frigates and other smallboys won't usually let a Frog land, especially when they're not at flight quarters.

A poll of the crew determines that a certain grouping of lights "must be" the LPH, and the approach to final begins. The *visual* approach, that is. Ha! It's still IFR out there. 'Better stay on the gauges and start a standard turn to the left. Slow down a mite and lose a bit of altitude. A lot of folks tell me there's no difference between their day and night patterns. Maybe so, but not when they're flying with me. My pattern is wider, the final leg is deeper, and the 90 is higher. A night shipboard approach is an IFR procedure turn inbound flown at 300 feet. Pilots who lock onto the ship visually at the 180 and watch it out the side window make the air boss say things like, "You're low," or, in a higher voice, "Wave off! Wave off!" So it's head in the cockpit, make your turn on instruments, and rely on the other pilot and crew chief for navigation.

'Long about the 45-degree position, the lights on the bridge and the deck start to form that renowned "visible horizon." Now it's out of the cockpit, establish a glide slope, and get the closure rate under control. The boss has cleared me for Spot 4, but where is it? Look for the LSE and his suit of lights. Rats, his suit must be busted and he's using taxi wands. The flight deck crew must save old, weak batteries to use on a night like this. Take a glance at the RMI and try to match the ship's Foxtrot Corpen. The boat's still swinging — that BRC's 20 degrees different from what they told me when I was abeam. A little sashaying to get over the spot. The LSE gives the land signal, the crew chief says it looks good, and plunk, I'm safe on deck.

Whew! Oh, no! He's giving me the launch signal!

EGAD, I HATE NIGHT FLYING!

PADDLES CONTACT

The backup LSO - cooperation and respect

By LCDR Dizzy Gillespie
Officer in Charge
LSO School
NAS Cecil Field

DUSK begins to settle on a hazy, milk bowl afternoon in the Indian Ocean. A piece of cake recovery begins as Paddles checks out the platform, landing area, and lens. It's been a long day — the smell of suntan oil and the sparkle of sunglasses highlight the eight members of the LSO team on the platform. It's such a nice afternoon that the senior CAG LSO decides he'll wave the recovery and designates the senior team leader to be his backup LSO.

"101 Tomcat, ball, 5.0, Clara, lineup" surprises our team as the sun settles behind the lens. "Roger Ball" barks CAG Paddles.

Silence.

"Power, right for lineup, wave it off!" commands a different voice. Instantly the afternoon's calm and quiet setting is shattered by twin TF-30s thundering above the flight deck.

The atmosphere has suddenly changed on the platform to overcast, lightning in all quadrants, and chills as the CAG LSO leers at his backup and questions in a menacing tone, "Why did you wave him off? When I'm up front, don't say anything, and don't ever do that again!"

How does an LSO team function with only one active member? The pilot relies on Paddles to perceive relative motion, make quick assessments, and act on a variety of environmental, ship, and aircraft conditions. This process involves intense concentration by the controlling LSO on the approaching aircraft. Any CAG LSO worth his liberty grog is trained to handle both the operating tempo and those pressures involved with each approach. Unfortunately, even the CAG LSO is human (gasp) and can get as emotionally involved in an approach as his trainees ("getaboarditis").

The backup LSO, designated by the senior experienced Paddles on the platform, performs several collateral tasks to assist the controlling LSO. These tasks do not relieve him of his responsibility to hawk each and every approach as if he were "up front" and, when the aircraft is in *extremis*, to display the guts and professionalism necessary to keep an otherwise quiet afternoon from becoming a horror story.

The CAG LSO training session, with all team members present, should set the tone of the platform's operations and assign specific responsibilities to each member. As the most experienced LSO, the backup LSO must be fully competent with and conversant on the various conditions to be encountered during all types of recovery.

LSOs learn their trade by controlling real airplanes from the platform. New LSO trainees make mistakes, either in not perceiving a dangerous situation or in delaying or deleting an appropriate call. CAG and air wing pilots don't want to hear a chorus of voices in final approach, but there comes a time when training stops and safety begins. Many CAG LSOs use the "When I begin to talk I have the pass" system when on the platform as backup LSO. This precludes confusion concerning just who will continue the talkdown if necessary.

The waveoff option is slightly different, however. Except for a new trainee inadvertently giving a dangerous in-close (inflight) waveoff, both the controlling and backup LSO must fully understand their responsibility to the aircraft and the ship. *When in doubt, wave him off.* As a training point, the senior LSO's job now is to analyze the waveoff and teach his team the reason why the waveoff occurred or why it should not have been given. To instill a do-nothing attitude into a position that is as crucial as the pilot/controlling LSO relationship greatly reduces the expected success rate of that team.

As a former CAG LSO, I remember looking with particular favor on team leaders acting as backup LSOs who saw something I didn't and were mature and confident enough to make a crucial, possibly lifesaving decision. Individuals like those should be nominated and assigned to the future CAG LSO community. That way, they'll be better trained and ready to take charge when the chips are down. Teamwork, responsibility, and credibility can make the LSO job easier, more fun, and a success story.

We request comments on these "Paddles Contact" articles and other LSO topics be sent to Officer in Charge, Navy LSO School, Box 171, NAS Cecil Field, FL 32215.

Photo by LT Jim Harnar

When things get quiet in Iceland

By LTJG Brian Cosgrove
VP-11

THEY'RE right when they say Iceland is P-3 country. What a great flight! Time to take this plane home and hit the club for a cold one.

We're more than halfway through this deployment now, and this crew is working like a well-oiled machine. You can almost predict what the other cockpit crewmembers will do in a given situation.

"Approach checklist."

Man, what a nice evening! Hard to get any night time up here when the sun doesn't set until 2300. Nice and clear, though. Let's see, the VORTAC to Runway 29 looks really good, and everything is set for a simulated nonprecision approach.

"Gear down, landing checklist."

Rolling final and everything looks good. Going to impress the PPC with this one.

"Let's arm and start the APU. That way, we'll be able to shift them down when we clear the duty and save a little gas."

That's it, over the threshold and the speed's right on. Start easing the power off and flare, flare, yea! Not bad for a 3P! Catch the first turnoff onto the off-duty runway, and it'll be a long taxi down to the line area.

"Second Mech, shift and shut down the outboards."

"Yessir, outboards shifted and . . . shut down."

"Roger, shift down 2 and 3."

"Yessir, shifted and . . . Oh @##&%$(!"

Now what? Boy, it's getting awfully quiet in here. Sure are a lot of lights coming on. Oh man, he secured the inboards! Well, I'll just keep it rolling to get off this runway and onto the taxiway. Set the parking brake.

"Give me the secure checklist, and we'll follow it with the abbreviated before-start."

Okay, nothing hurt here but our professional pride. It's a very good reminder, though, that no matter how well you know your fellow crewmembers, keep an eye on each other. In this case, not taking a checklist seriously was just embarrassing. Other cases can be fatal. So watch out for the other guy, and make sure he's watching out for you!

LETTERS

Luck It's Not!

Patuxent River, MD — Have you been involved in an ejection sequence? If you have and feel lucky to be alive, you'd better start looking long and hard at yourself!

As a Parachute Rigger, I hear and read more and more about fliers being "lucky" during ejections. There should be no such thing as luck to a thorough aviator. A lot of people work hard to get you and your aircraft airborne and back again safely. Then comes that one flight when you realize that your aircraft isn't going to make it. What have you done to make your ejection safe? The people in the AME and PR ratings will give you a chance, but it all begins with you! Do you know your safe ejection envelope, body position, and flight gear requirements?

Once up the rail, do you know what to do in case of material failure? Try these: no oxygen flow, no seat-man separation, automatic actuator failure. Our ejection systems have backups, just like aircraft. So there you are, breathing your cool oxygen under that big beautiful parachute . . . Wait a minute — you're not safe yet! Hey, what about the four-line release and the FLU-8?

Well, I could go on forever with landings, use of survival gear, and survival situations, but I don't think it's necessary. *Safe ejection sequences have nothing to do with luck!*

PR2 W. S. Thomas
AIMD Paraloft

• **Even so, we're lucky to be working with PR2s like you. — Ed.**

Re: "F/A-18 Ejection," Oct '82

Norfolk, VA — As a former naval aviator and safety/standardization officer, I question the F/A-18 pilot's decision to retract his landing gear when he knew he had significant problems in that area (mainmount gone). Is this SOP for the *Hornet?* How about other high-performance aircraft? Unless my memory has faded beyond limits, I thought it was more or less SOP to leave landing gear down in such situations. Please correct me if I am in error.

Maj Joe Homer, USMC (Ret.)
OHSAT Safety/Security

• **The article did not address this obvious miscue by the pilot. Maj Homer's point is well taken. The Naval Safety Center's recommendation stands: "In the event of a landing gear malfunction, get them down and leave them down." —Ed.**

Footnote to a Nightmare

Jacksonville, FL — I'd like to express my sincerest appreciation to Mr. Blake Rader for the superb illustration he provided to accompany my article, "Nightmare," in the September '82 issue. Had I been able to make a photograph of the situation described in the article, it could not have conveyed our difficulty more graphically than Mr. Rader's marvelous illustration.

I've previously observed Mr. Rader's superb work in your publication, and I'm proud to have authored an article that he so graphically illustrated. My sincerest thanks.

LCDR Peter S. Blackwood
Staff Safety Officer
COMSEABASEDASWWINGSLANT

High Level Praise for Low Level Wind Shear

Orlando, FL — Thanks to *APPROACH* and LCDR Towers for a really good article on the subject of wind shear. You'll never know the value of your article, because no one counts the accidents that don't happen. Rest assured it was worth writing and will save a life or two.

I almost took issue with your paragraph 3 statement, "Had the pilot lowered the nose . . .," because too many tactical types get in trouble when they shoot for the moon. But I stuck with you until you treated angle of attack as it should have been (smile).

Again, a super article on the subject.

CDR R. H. Ross
NAVTRAEQUIPCEN

Note

RADM T. C. Steele now wears two hats. In addition to being Commanding Officer of the Naval Safety Center, he's CNO Safety and Occupational Health Coordinator, OPNAV OP-09F.

As OP-09F, RADM Steele coordinates the overall Navy Safety and Occupational Health Program for the Chief of Naval Operations. RADM Steele is also the principal advisor to CNO on safety and occupational health matters.

CAPT R. M. Rausa (OP-09FB) will keep the office in the Pentagon running smoothly. Correspondence on safety and health practices can be sent to:

Office of the Chief of Naval Operations
OP-09F
Washington, D. C. 20350.

The telephone number is (commercial) 202-695-7500, (Autovon) 225-7500.

Bravo Zulu Submissions

Since February 1972, *APPROACH* has been recognizing outstanding feats of airmanship in naval aviation — usually in times of emergency. The term "Bravo Zulu" means "well done" and comes from a flag hoist signal found in ATP 1(B), Vol. II.

All Bravo Zulu submissions must include command and wing endorsements. Please append any message traffic related to the event to your smooth narratives.

Photos are also required with the submission. We prefer 5" x 7" black and white prints that show the individual(s) in action (looking at the rotor system, whistling for a trouble truck, studying an approach plate, descending from the cockpit) rather than posed shots of aviators at parade rest. Try some unusual angles! It's disconcerting to read a narrative of fliers performing dynamic feats of safe aviating and then see a photo of the same crew standing mannequin-like in front of a chocked-and-chained aircraft. Can these really be the same fliers?

In the narratives, try some quotes. What did the aircraft commander say when he learned he'd have to abort the takeoff on an icy runway or land single-engine in a high sea state?

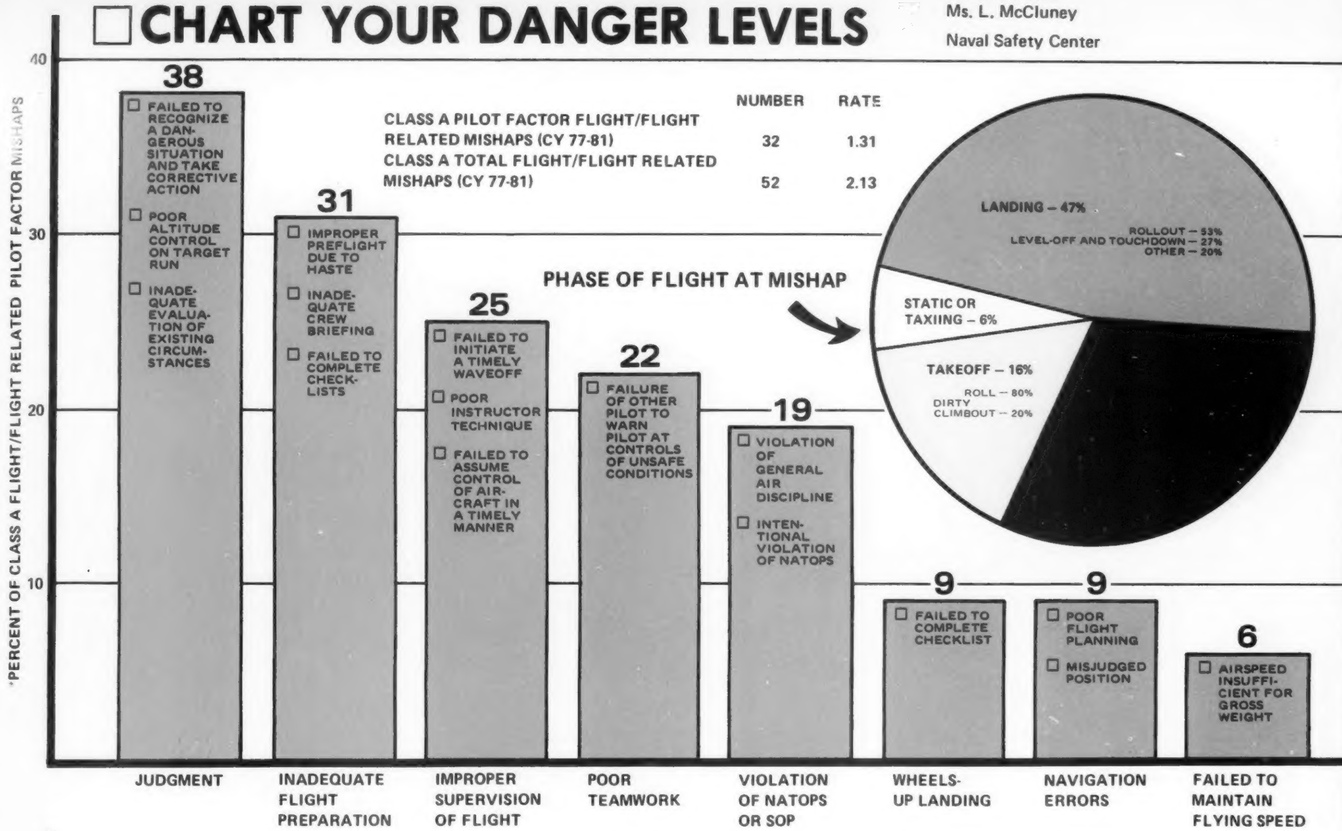
What did the Tower say? UHF and ICS transmissions give the narratives more punch.

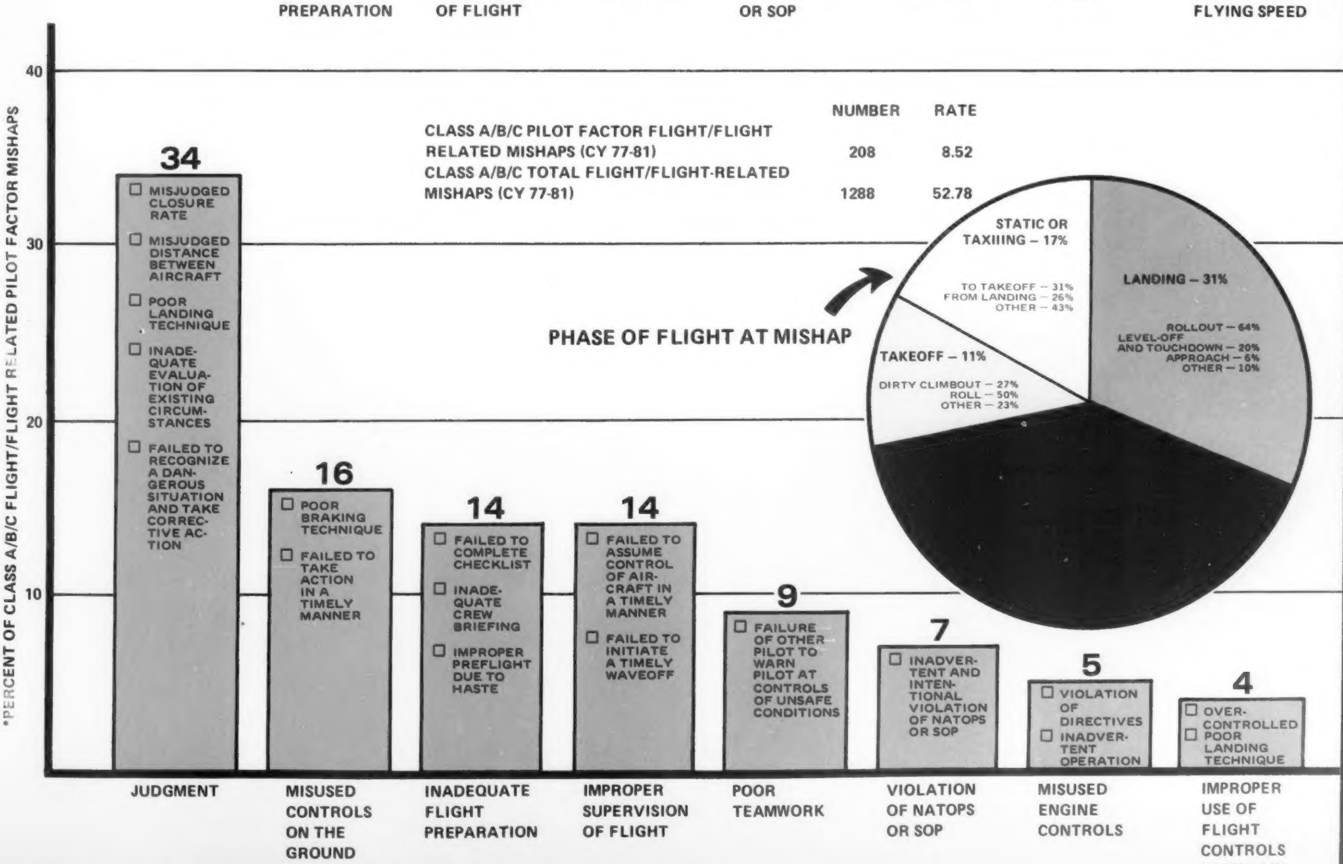
In any case, mail all Bravo Zulu submissions to *APPROACH*, attn: Bravo Zulu, Code 72, Naval Safety Center, NAS Norfolk, VA 23511.

☆U.S. GOVERNMENT PRINTING OFFICE: 1982—639-006/20

MULTI-ENGINE PILOTS:
☐CHART YOUR DANGER LEVELS

Research by
Dr. M. S. Borowsky
LT. R. A. Wall
Ms. L. McCluney
Naval Safety Center





*PERCENTAGES MAY NOT TOTAL 100 SINCE MORE THAN ONE FACTOR MAY BE PRESENT IN A GIVEN MISHAP

Don't let icing spoil your piece of cake!

Naval Safety Center
NAS Norfolk, Virginia